

**COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Northern Virginia Regional Office**

STATEMENT OF LEGAL AND FACTUAL BASIS

CNG Transmission Corporation
Leesburg Station
Loudoun County, Virginia
Permit No. NVRO71978

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, CNG Transmission Corporation has applied for a Title V Operating Permit for its natural gas pipeline compressor station in Loudoun County, Virginia. The Department has reviewed the application and has prepared a Title V Operating Permit.

Engineer/Permit Contact:_____ Date:_____

Air Permit Manager:_____ Date:_____

Regional Permit Manager:_____ Date:_____

FACILITY INFORMATION

Permittee

CNG Transmission Corporation
445 West Main Street
Clarksburg, West Virginia 26302-2450

Facility

Leesburg Station
40620 Consolidated Lane
Leesburg, Virginia 20175

AIRS ID No.: 51-107-0101

SOURCE DESCRIPTION

SIC Code: 4922 - Natural Gas Transmission. The Leesburg Station is a natural gas transmission facility. Natural gas is received via pipelines from an upstream compression station, compressed, and pumped into outlet pipelines for transmission downstream. The Leesburg facility utilizes two (2) natural gas-fired stationary reciprocating internal combustion engines, each rated at 3,010 horsepower (HP), to drive the natural gas compressors. The engines are each equipped with an oxidation catalyst to control carbon monoxide emissions. Auxiliary equipment at the facility includes one natural gas-fired boiler rated at 2.75 MMBtu/hr, and one natural gas-fired generator rated at 550 HP.

The facility is a Title V major source of nitrogen oxides located in the Northern Virginia Ozone Nonattainment area. Loudoun County is in attainment with the National Ambient Air Quality Standards (NAAQS) for all other criteria pollutants. The Leesburg Station is a major source for the nonattainment new source review program, and a PSD minor source. The facility is permitted under a minor NSR Permit issued on January 21, 2000. This permit superseded the initial NSR permit issued on July 22, 1992, and amended on February 10, 1998.

COMPLIANCE STATUS

The facility is inspected once a year by the Virginia DEQ. The last inspection was conducted on August 31, 1999. The facility was determined to be in compliance.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units and air pollution control devices for the Leesburg Station are identified in Table 1 below.

TABLE 1. Summary of Emission Units and Control Devices at the Leesburg Station

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity	Pollution Control Device Description (PCD)	PCD ID	Pollutant Controlled	Applicable Permit Date
Internal Combustion Engines							
EN01	S01	Dresser Rand Model TLAD8 natural gas-fired IC compressor engine (constructed 1992)	3,010 horsepower	Johnson Matthey LHC Catalyst (constructed 1993)	C01	CO	01/21/2000
EN02	S02	Dresser Rand Model TLAD8 natural gas-fired IC compressor engine (constructed 1992)	3,010 horsepower	Johnson Matthey LHC Catalyst (constructed 1993)	C02	CO	01/21/2000
AUX01	S03	Caterpillar Model 3508 natural gas-fired Auxiliary Generator (constructed 1992)	550 horsepower	---	---	---	01/21/2000
Fuel Burning Equipment							
B01	S04	Ajax Model WGFD-2750 natural gas-fired boiler (constructed 1992)	2.75 MMBtu/hr	---	---	---	01/21/2000

EMISSIONS INVENTORY

The emissions inventory information presented is based on actual emissions data submitted in conjunction with the Title V permit application. While the 1998 annual emissions statement has been received by the DEQ, the 1997 emissions data are presented in this section because the hazardous air pollutants (HAP) emissions characterization is complete for calendar 1997. The HAP emitted from this facility are not required to be calculated for the annual emissions statement as they are all considered volatile organic compounds. A copy of the actual emissions estimation calculations as well as the 1997 annual emissions statement is included in Attachment A. In addition, the 1998 annual emission statement is included in Attachment A. The 1997 actual emissions are summarized in the following tables.

TABLE 2. 1997 Actual Emissions of Criteria Pollutants for the Leesburg Station

Emission Unit	Criteria Pollutant Emission in Tons/Year				
	VOC	CO	SO ₂	PM-10	NO _x
EN01	2.4	8.7	0.01	0.17	8.1
EN02	3.0	10.8	0.013	0.21	10.0
AUX01	0.001	0.018	0.00002	0.0004	0.024
B01	0.07	0.18	0.007	0.14	2.2
FUG ¹	11.53	---	---	---	---
Total	17.0	19.7	0.03	0.52	20.3

¹ Fugitive emissions are included in the calculation for emission inventory submittal and emission fee's. The fugitive emissions from blowdowns, valves, fittings, storage tanks etc. are not subject to any other applicable requirements.

TABLE 3. 1997 Actual Facility Emissions of Hazardous Air Pollutants for the Leesburg Station

Pollutant	Hazardous Air Pollutant Emission in Tons/Year
Formaldehyde	1.5
Benzene	0.083
Toluene	0.026
Ethylbenzene	0.01
n-Hexane	0.1
Xylenes	0.032
Acetaldehyde	0.032
Acrolein	0.022
Ethylene Glycol	3.2

EMISSION UNIT APPLICABLE REQUIREMENTS - (Emission Units EN01 and EN02)

Limitations

The following applicable NO_x, CO, VOC, and formaldehyde limitations are State BACT requirements from Conditions 3, 4, 6, 10, 13, and 19 of the minor NSR permit issued January 21, 2000. A copy of the permit is included as Attachment B.

- Condition 3: CO emissions from the engines shall be controlled by oxidation catalyst.
- Condition 4: The approved fuel for the compressor engines is natural gas.
- Condition 6: Limits on combined fuel consumption for the engines.
- Condition 10: Emission limits for NO_x, CO, VOC, and formaldehyde are established for each engine.
- Condition 13: Visible emissions limit of 5% opacity for the engines.
- Condition 19: Requirement have written operating procedures for the air pollution control equipment and to provide training for operators.

Monitoring and Recordkeeping

The monitoring and recordkeeping requirements in Conditions 14, 18, and 19 of the NSR permit have been modified to meet Part 70 requirements, with additional monitoring and recordkeeping provisions added, as needed, to establish sufficient periodic monitoring to document compliance with the applicable requirements for the engines.

The permit includes provisions for maintaining records of all required emission data and operating parameters necessary to demonstrate compliance. These records include: the consumption of natural gas by the compressor engines, scheduled and unscheduled maintenance on the engines, periodic NO_x, CO, and VOC measurements on each engine, and temperature change and pressure drop readings across the oxidation catalyst for each engine. Additionally, the permittee must maintain written operating procedures for the engines and the related air pollution control equipment and must train all operators on the proper operation of the equipment. The proper operation and maintenance of the compressor engines functions as air pollution control for all criteria pollutants. Therefore, the requirement to maintain written operating procedures and provide training to operators applies to the compressor engines as well as the oxidation catalyst.

Compliance with the emission limits established for NO_x, CO, VOC, and formaldehyde is achieved by proper operation and maintenance of the engines, and by abiding by the fuel throughput restrictions established in the permit. Additionally, CO is controlled by oxidation catalyst for each engine. The permit requires the permittee to develop an inspection and

maintenance schedule for the engines and control systems and maintain records of all scheduled and non-scheduled maintenance. The permit also requires all operators to be trained on the proper operation of the process and air pollution control equipment, and that records of the training be maintained.

The permit requires periodic testing to be performed on the exhaust from each engine. The testing is required to be conducted on each engine at a frequency of once every six-month period, beginning with the issuance date of the permit. The testing will be conducted using procedures approved by the DEQ; these procedures will not necessarily entail use of EPA reference methods. As the purpose of the testing is to provide a reasonable assurance of compliance with emission limits, the testing will likely involve use of portable gas analyzers to measure the NO_x, CO, and diluent O₂ concentrations. VOC emissions will be measured by collecting a sample of exhaust gas and measuring for total hydrocarbons, methane, and ethane. The methane and ethane emissions will be subtracted from the total hydrocarbon emissions to obtain non-methane and non-ethane hydrocarbon emissions.

It is worth noting that CNG Transmissions has conducted annual compliance testing on each engine exhaust since the initial construction of the facility. Testing has been performed once a year, beginning in June 1993, for NO_x, CO, and VOC using approved EPA reference method test procedures. The test data indicate that the source has continued to operate in compliance with established emission limits and supports the use portable gas analyzers to conduct compliance evaluations for the facility.

The periodic testing will serve several purposes. First, the testing will be used to demonstrate that proper operation and maintenance of the engines and control system continues to achieve compliance with the established permit limits for NO_x, CO, and VOC. Additionally, the periodic testing for CO and VOC will provide a measure of the engine operation and combustion efficiency. Compliance with the formaldehyde emission limits will be inferred by demonstrating compliance with criteria pollutant emission limits. Second, the measurements will be used to confirm the emission factors which will be employed to demonstrate compliance with annual permit limits. Third, the CO testing will provide an indication of the continued effectiveness of the oxidation catalyst in controlling CO emissions.

If the periodic testing indicates an exceedance of an emission limit, the permittee is required to take corrective action to correct any equipment which is not operating properly. If corrective action does not eliminate the emissions excursion, the permittee is required to conduct an EPA reference method test in accordance with test methods identified in the permit, or other procedures approved by the DEQ. The reference method testing will be used to determine the compliance status of the engine(s). It is worth noting that an excursion above an emission standard which is measured using a portable gas analyzer may be considered credible evidence of a violation, however, it does not necessarily establish or correspond to a violation of the permit.

Pollutant-specific emission factors will be used to calculate annual emissions on a monthly basis for each engine. Emission rates will be calculated using manufacturer emission factors for NO_x, CO, and VOC. The formaldehyde emission factor is based on test data collected by the Gas Research Institute (GRI), as reported in the GRI-HAPData program (Version 1.0) developed by

Radian International. These emission factors correlate closely with the emission factors contained in draft Chapter 3.2, *Natural Gas-fired Reciprocating Engines* (dated 02/97), of the EPA document entitled Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, commonly referred to as AP-42. The factor used to represent formaldehyde emissions represents the best available data on formaldehyde emissions for these engines.

The use of these emission factors provides a reasonable assurance of compliance with emission limitations, and underscores that the operational and fuel restrictions are the controlling parameters limiting emissions from the engines. The periodic measurement of NO_x, CO, and VOC emissions will serve as a check on the continued representativeness of the manufacturer supplied emission factors. Emissions from the operation of each engine will be calculated on a monthly basis using the following equation:

$$E_i = EF_i \times C \times O \times \frac{1}{453.593}$$

where:

E _i	=	Emissions of pollutant i, lbs/time period
EF _i	=	Emission factor for pollutant i, g/hp-hr (manufacturer factors) <ul style="list-style-type: none"> • 1.50 for NO_x • 1.63 for CO • 0.45 for VOC • 0.16 for formaldehyde
C	=	Capacity rating of each engine, hp
O	=	Operating hours for time period
453.593	=	Conversion factor, grams per pound

The permit establishes periodic monitoring requirements for the oxidation catalyst by requiring the permittee to monitor the temperature change and pressure drop across the catalyst. These parameters, in conjunction with the periodic testing to evaluate CO emissions, will provide a reasonable assurance that the catalyst remains effective. The permit requires the permittee to establish indicator ranges for the temperature change and pressure drop readings for purposes of indicating proper operation of the control system. These ranges must be established within 30 days after the first semi-annual periodic monitoring test. The permittee is required to submit a report documenting the establishment of the indicator ranges to the DEQ for approval. This report will remain a part of the permit record.

The engines burn pipeline quality natural gas. As long as the engines are properly maintained and operated, there is very little likelihood that the opacity standards will be violated. This position is supported by the September 15, 1998 EPA memorandum from Eric Schaffer and John Seitz entitled "Periodic Monitoring Guidance for Title V Operating Permits Programs". Therefore, the permit conditions requiring proper operation and maintenance of the engines, with associated training and recordkeeping, establish a federally enforceable maintenance program which provides a reasonable assurance of compliance with the opacity standards.

Testing

The permit requires the permittee to conduct an EPA reference method test program once during the five year permit term. Testing shall be conducted to evaluate the compliance of the engines with respect to the applicable NO_x, CO, and VOC emission standards. A table of test methods has been included in the permit to identify the current reference method test procedures for the subject pollutants.

Reporting

The permittee is required to report excursions outside of the established indicator ranges for the oxidation catalyst monitoring, and excursions above emission limits revealed during the periodic emissions monitoring. The permit also establishes time schedules for submitting copies of test reports to the DEQ. The general reporting requirements enumerated in the General Requirements section of the permit also apply.

Streamlined Requirements

Condition 5 of the January 21, 2000, new source permit requires the facility to be constructed so as to allow for emissions testing upon reasonable notice. This condition was satisfied with the construction of the source and is not included in the Title V operating permit.

The Leesburg Station is a major source of NO_x emissions located in the Northern Virginia Ozone Nonattainment Area and is required, at a minimum, to institute Reasonably Available Control Technology (RACT) for the control NO_x. The source is also required to institute RACT for control of VOC emissions as the facility has an uncontrolled emission rate of VOC greater than 25 tons per year. The requirement for NO_x and VOC RACT controls is established in 9 VAC 5 Chapter 40, Article 4 of the state regulations. The state RACT regulations were promulgated in response to requirements of the federal Clean Air Act (Section 182) targeted at reducing emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) which contribute to the formation of tropospheric (lower atmosphere) ozone.

As of the writing of this proposed federal operating permit and state of basis, a proposed State Operating Permit implementing NO_x and VOC RACT provisions for the Leesburg Station has been prepared and been through a 30-day public comment period. This proposed permit establishes as RACT the same emission controls and limitations as contained in the State Air Pollution Control Board permit to install, modify, and operate that was issued on July 22, 1992 and superseded with the January 21, 2000 permit amendment. These controls and limitations were determined to represent the required best available control technology in the initial permit review, and therefore, for emissions of NO_x and VOC are no less stringent than RACT. The proposed NO_x RACT emission level from each of the two compressor engines is 1.5 grams per brake horsepower-hour (g/bhp-hr). The proposed VOC RACT emission level from each of the two compressor engines is 0.46 g/bhp-hr. This rate equates to the 3.0 lbs/hr limit established in the initial permit for the facility. These emission rates represent the manufacturer guaranteed emission rates while each engine operates at design capacity. Design capacity is defined to

mean operation at 95 percent or greater of rated horsepower. These proposed RACT emission levels are the same as the already established limits for the engines and are not repeated in the Title V permit as they would be redundant.

The remaining general conditions in the new source permit have been modified to meet the general condition requirements of 40 CFR 70 and 9 VAC 5 Chapter 80, Article 1.

EMISSION UNIT APPLICABLE REQUIREMENTS - (Emission Units B01 and AUX01)

Limitations

The following limitations are State BACT requirements from the minor new source review permit issued on January 21, 2000. A copy of the permit is included in Attachment B.

- Condition 4: The approved fuel for the boiler and auxiliary generator is natural gas.
- Condition 7: Limit on natural gas throughput for the boiler.
- Condition 8: Limit on natural gas throughput for the auxiliary generator.
- Condition 9: Limit on annual operating hours for the auxiliary generator.
- Condition 11: NO_x emission limit established for the boiler.
- Condition 12: NO_x and CO emission limits established for the auxiliary generator.
- Condition 13: Visible emissions limit of 5% opacity established for the boiler and auxiliary generator.

Monitoring and Recordkeeping

The monitoring and recordkeeping requirements in Condition 14 of the NSR permit have been modified to meet Part 70 requirements.

The permit includes requirements for maintaining records of all emission data and operating parameters. These records include the consumption of natural gas by the boiler and auxiliary generator, and the annual operating hours of the auxiliary generator. Additionally, the permit requires that an inspection and maintenance schedule be established for the boiler and auxiliary generator to assure that the units are operated in accordance with good air pollution control practices.

The short term (e.g. hourly) NO_x emission limit for the boiler, and the short term NO_x and CO emission limits for the auxiliary generator are all based on manufacturer emissions data. The annual emission limits established for the two units are based on the maximum hourly emission rates and allowable operating hours. The 12-month cumulative fuel throughput limitations for

each unit were established on the maximum hourly fuel consumption rates and the allowable annual operating hours. As long as the natural gas throughput limits and operating hours limit are not violated, there is very little chance that criteria pollutant emission limits will be violated. Therefore, recordkeeping demonstrating compliance with the natural gas throughput limits for both units, and recordkeeping demonstrating compliance with operating hours for the auxiliary generator can be used to demonstrate compliance with NO_x and CO, satisfying the periodic monitoring requirements.

Emissions from the operation of the boiler and auxiliary generator will be calculated on a monthly basis to demonstrate compliance with annual limits using the following equation:

$$E_i = EF_i \times H$$

where:

E_i	=	Emissions of pollutant i, lbs/time period	
EF_i	=	Emission factor for pollutant i, lbs/hr (mfg. factor assumes maximum emissions)	
		<u>Auxiliary Generator</u>	<u>Boiler</u>
		• 2.4 for NO _x	• 0.5 for NO _x
		• 1.8 for CO	
H	=	Hours of operation during time period	

There is no monitoring for the visible emissions limitation. Compliance with the visible emission limits in the permit is expected from the natural gas fired boiler and generator as long as the units are maintained and operated properly. Condition IV.B.1 establishes equipment inspection and maintenance as a federally enforceable requirement in lieu of periodic monitoring for opacity. This inspection and maintenance program along with the required documentation provides assurance of continued proper operation of the engines.

Testing

The permit does not require source emission tests. A table of test methods has been included in the permit if testing is performed. The DEQ and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

No specific reporting requirements have been included in the permit.

Streamlined Requirements

As stated previously, the Leesburg Station is subject to VOC and NO_x RACT provisions. The proposed State Operating Permit implementing NO_x and VOC RACT provisions establishes as

RACT the same emission controls and limitations as contained in the State Air Pollution Control Board permit to install, modify, and operate that was issued on July 22, 1992, amended February 10, 1998, and superseded on January 21, 2000. The February 10, 1998 amendment accounts for the auxiliary generator which was actually installed. The installed auxiliary generator is a less NO_x-emitting model than what was identified in the original permit. The February 10, 1998 permit amendment restricts the NO_x emissions from the auxiliary generator to 2.4 lbs/hr. This corresponds to a NO_x RACT emission rate of 2.0 g/bhp-hr for the rated 550 horsepower auxiliary generator (2.4 lbs/hr x 1/550 hp x 453.6 g/lb = 2.0). No permit limits are established for VOC emissions from the generator as these emissions are considered negligible. The proposed RACT emission level of 2.0 g/bhp-hr is the same as the already established limit for the engine and is not repeated in the proposed Title V permit as it would be redundant.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal operating permit sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions, including those caused by upsets, within one business day.

FUTURE APPLICABLE REQUIREMENTS

The Leesburg Station contains stationary internal combustion engines. Maximum achievable control technology standards (MACT) for stationary internal combustion engines, under 40 CFR Part 63 and 9 VAC 5 Chapter 60, are scheduled for promulgation on November 15, 2000. The facility is not currently considered a major source of hazardous air pollutant emissions. Therefore, the Leesburg Station will not likely be subject to those requirements when promulgated. This future rule is not an applicable requirement under 40 CFR Part 70 and 9 VAC 5 Chapter 80, Article 1. It is noted for informational purposes.

INAPPLICABLE REQUIREMENTS

Inapplicable requirements identified by the applicant include the following:

- 40 CFR Part 64 - Compliance Assurance Monitoring: The Compliance Assurance Monitoring (CAM) rule applies to pollutant-specific emission units with pre-control device emissions of regulated pollutants exceeding major source thresholds. The units must have control devices in place and applicable requirements for the subject pollutant. The rule requires sources to monitor the operation and maintenance of the control devices to ensure compliance with applicable requirements. The Leesburg Station does not have any emission units which emit pre-control device emissions above the major source thresholds. See memo to file dated September 17, 1999, for additional information on this determination.

- 40 CFR Part 63, Subpart B - Requirements for Control Technology Determinations for Major Sources in Accordance with Clean Air Act Sections, Sections 112(g) and 112(j): This subpart establishes the requirements for determining case-by-case maximum achievable control technology standards (MACT) for major sources of hazardous air pollutants which include one or more stationary sources included in a source category or subcategory for which the EPA Administrator has failed to promulgate an emission standard. The Leesburg Station is not a major source of hazardous air pollutants.
- 40 CFR Part 82 - Protection of Stratospheric Ozone: The Leesburg Station does not use any ozone depleting substances regulated by the subject rule.

COMPLIANCE PLAN

CNG Transmission Corporation is currently in compliance with all applicable requirements. No compliance plan was included in the application or the permit.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation ¹	Pollutant(s) Emitted (5-80-720 B)	Rated Capacity (5-80-720 C)
HW01	AO Smith Model FSGL40216 hot water heater	9 VAC 5-80-720 C	---	0.04 MMBtu/hr
PW01	Zep Super Brute Model 906601 parts washer	9 VAC 5-80-720 B	VOC	---
PW02	Zep Super Brute Model 906601 parts washer	9 VAC 5-80-720 B	VOC	---
TK01	Ethylene glycol storage tank	9 VAC 5-80-720 B	VOC	5,000 gallons
TK02	Floor drain waste storage	9 VAC 5-80-720 B	VOC	2,000 gallons

Emission Unit No.	Emission Unit Description	Citation ¹	Pollutant(s) Emitted (5-80-720 B)	Rated Capacity (5-80-720 C)
	tank			
TK03	Reclaim oil storage tank	9 VAC 5-80-720 B	VOC	2,000 gallons
TK04	Waste oil storage tank	9 VAC 5-80-720 B	VOC	2,000 gallons
TK05	Lube oil storage tank	9 VAC 5-80-720 B	VOC	8,000 gallons
TK06	Pipeline fluid storage tank	9 VAC 5-80-720 B	VOC	2,000 gallons

¹The citation criteria for insignificant activities are as follows:
 9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application
 9 VAC 5-80-720 B - Insignificant due to emission levels
 9 VAC 5-80-720 C - Insignificant due to size or production rate

CONFIDENTIAL INFORMATION

The permittee did not submit a request for confidentiality. All portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

The public comment period began with the publication of the public notice in The Washington Times newspaper on December 9, 1999. The public comment period closed on January 8, 2000. No comments were received from the public regarding the draft permit. No comments were received from the affected states of Maryland or West Virginia, or from the local governments of Washington, D.C., Fairfax County, or the City of Alexandria.

Comments were received from Mr. David Campbell of the U.S. EPA via email on January 5, 2000 and received via the regular mail on January 10, 2000. Two specific comments were made on the draft permit. The first comment concerned a proposed emergency operating scenario in the draft permit which would allow temporary replacement of a failed engine. The second comment concerned the location of the formaldehyde limits in the Title V permit. The limits were listed as state-only enforceable in the draft permit. The EPA asserted that because the formaldehyde limits were established under a minor NSR permit program which is approved in the State Implementation Plan (SIP), the emission limits are federally enforceable. Both of the EPA comments have been addressed in the permit. The emergency operating scenario has been removed, and the formaldehyde emission limits have been listed as federally enforceable limits. See the memo to file dated March 08, 2000, for additional information on the EPA comments on the draft operating permit and responses to these comments.

ATTACHMENT A

1997 ACTUAL EMISSIONS CALCULATIONS
AND
ANNUAL EMISSION UPDATES FOR 1997 AND 1998

ATTACHMENT B

JANUARY 21, 2000, PERMIT TO CONSTRUCT AND OPERATE